Claim Listing and Claim Amendments. Please enter the following claim amendments:

1. (Previously Presented) An apparatus comprising:

at least one transducer assembly positioned in view of a body cavity and configured to transmit ultrasound of at least one acoustic power having a fundamental frequency to the body cavity, receive echoes having a harmonic frequency and the fundamental frequency reflected from surfaces associated with the body cavity, and convert the fundamental and harmonic frequency echoes into fundamental and harmonic signals; and

a computer in signal communication with the at least one transducer assembly, the computer having executable signal processing software with programmed instructions to determine at least one harmonic energy level value associated with the echoes and to calculate a fluid volume contained in the cavity based upon the at least one harmonic energy level value associated with an echo having passed through the fluid.

2. (Previously Presented) The apparatus of claim 1, wherein the body cavity comprises a bladder and the fluid volume comprises urine.

3. (Previously Presented) The apparatus of claim 1, wherein the at least one transducer assembly includes a plurality of transducer assemblies positioned for transmitting and receiving echoes in a selected order.

4. (Previously Presented) The apparatus of claim 3, wherein the at least one acoustic power includes a first power to ascertain the subject's attenuation of echoes having the fundamental frequency and a second power to ascertain the conditions in which the subject generates echoes having at least one harmonic frequency of the fundamental frequency.

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5. (Previously Presented) The apparatus of claim 4, wherein the programmed instructions are applied to the fundamental and harmonic signals derived from in ultrasound beams that have passed through the fluid of the body cavity.

6-7. Canceled.

8. (Previously Presented) The apparatus of claim 3, wherein the plurality of transducer assemblies includes an array of five.

9. (Previously Presented) The apparatus of claim 8, wherein the array of five transducer assemblies are respectively oriented at angles OA, OB, OC, OD, OE, to an axis orthogonal to the plane of the transducer assemblies array, the angles being approximately OA =-25°, OB = 0°, OC +25°, OO = +25°, OE = +40°.

10. (Currently Amended) The apparatus of claim 9, wherein the transducer assemblies [array] are configured to ascertain at least one of ranges of bladder filling and to indicate a clinically important bladder filling level.

11. (Currently Amended) The apparatus of claim 10, wherein [the] at least one of the plurality of transducer [assembly] assemblies [includes] is coupled to a display to present inputted patient information, including at least one of gender, weight, age, and correction factors K derived from the calibration curve.

12. (Previously Presented) The apparatus of claim 11, wherein the calibration curve includes validated volume measurements to optimize correction factors K in a "self learning process".

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13. (Currently Amended) The apparatus of claim 11, wherein volume information of the cavity or the fluid may be frozen via a hold/start button connected with the at least one of the plurality of [transducer assembly] transducer assemblies.

14. (Previously Presented) The apparatus of claim 3, wherein the plurality of transducer assemblies are positioned so that the echo reflecting areas of the walls of the cavity are approximately located in a single cross-sectional sagittal plane.

15. (Previously Presented) The apparatus of claim 14, wherein the plurality of transducer assemblies are approximately disk-shaped.

16. (Previously Presented) The apparatus of claim 15, wherein the transducer assemblies are powered by a battery.

17. (Currently Amended) The apparatus of claim 14, wherein the transducer assemblies are configured to <u>generate data enabling a display device to</u> display correct caudal-cranial positioning of the transducer assemblies over a human bladder.

18. (Currently Amended) The apparatus of claim 1, wherein the <u>at least one</u> transducer assembly is connected with a cable to a housing containing an input device, a processor, a display and a power supply unit.

19. (Previously Presented) The apparatus of claim 1, wherein the at least one transducer assembly further includes an ultrasound coupling material covering the transducers for optimal acoustic coupling and patient convenience.

20. (Currently Amended) A method comprising:

positioning at least one transducer assembly in view of a body cavity;

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transmitting, with the <u>at least one transducer assembly,</u> a fundamental ultrasound frequency of at least one acoustic power to the body cavity;

receiving, with the <u>at least one transducer assembly,</u> echoes having the fundamental ultrasound frequency and at least one harmonic frequency thereof associated with the body cavity;

converting the received ultrasound echoes into fundamental signals and harmonic signals;

determining at least one harmonic energy level value associated with the echoes; and

calculating a fluid volume contained in the cavity based upon the at least one harmonic energy level value associated with an echo having passed through the fluid.

21. (Previously Presented) The method of claim 20, wherein determining at least one harmonic energy level value associated with the echoes includes applying computer executable signal processing software with programmed instructions to differentiate information from the fundamental and harmonic signals.

22. (Currently Amended) The method of claim 20, wherein positioning includes positioning an array of transducer assemblies configured to [transmitting] transmit ultrasonic beams into the subject with a predetermined spatial location and mounting angle.

23. (Previously Presented) The method of claim 22, wherein the array of transducer assemblies are acoustically coupled to the skin of the subject being measured using an acoustic coupling material.

24 (Previously Presented) An apparatus comprising:

at least one transducer assembly positioned in view of a bladder and configured to transmit ultrasound of at least one acoustic power having a fundamental frequency to the bladder, receive echoes having a harmonic frequency and the fundamental frequency reflected

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from surfaces associated with the bladder, and convert the fundamental and harmonic frequency echoes into fundamental and harmonic signals; and

a computer in signal communication with the at least one transducer assembly, the computer having executable signal processing software with programmed instructions to determine at least one harmonic energy level value associated with the echoes and to calculate a fluid volume contained in the bladder based upon the at least one harmonic energy level value associated with an echo having passed through the fluid.

25. (Previously Presented) The apparatus of claim 24, wherein the fluid comprises urine.

26. (Previously Presented) The apparatus of claim 25, wherein the at least one transducer assembly is adapted to transmit a beam of ultrasound sufficient to entirely subtend the bladder.

27. (Currently Amended) The apparatus of claim 24, wherein the programmed instructions [to differentiate information from the fundamental and harmonic signals comprises] comprise signals derived from predetermined depth ranges for the determination of fluid volume in the bladder.

28. (Previously Presented) The apparatus of claim 26, wherein transducer assembly comprises a curved single active piezo-electric element, shaped to form ultrasound beams at least one of a sphere sector and a cone sector.

29. (Previously Presented) The apparatus of claim 28, wherein the ultrasound transducer assembly includes a wide-angle lens to distribute the ultrasound beams to approximately encompass the bladder.

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30. (Previously Presented) The apparatus of claim 29, wherein the transducer assembly is adapted to transmit at a fundamental ultrasound frequency and is adapted to receive the fundamental and higher harmonic signals of the transmitted frequency.

31-33. Canceled

34. (Previously Presented) The apparatus of claim 27, wherein the programmed instructions to determine at least one harmonic energy level value associated with the echoes include algorithms for determining the scattered power of higher harmonics in the received signal and comparing the scattered power with the backscattered power in the fundamental frequency to calculate the urine volume.

35. (Previously Presented) The apparatus of claim 34, wherein the at least one acoustic power includes a low transmit power and a high transmit power to enhance bladder filling measurement and eliminate patient variation due to instance obesity using combined pulse sequences arising from the low transmit and high transmit powers.

36. (Previously Presented) The apparatus of claim 35, wherein the combined pulse sequences arise from echo signals at a depth close to the position of the average anterior bladder wall in determining volume of fluid to limit the effects of variation in the body proximal to the transducer assembly.

37. (Previously Presented) The apparatus of claim 36, wherein the combined pulse sequences arise from echo signals may be altered by varying the transmitted power in subsequent pulse transmissions, such that linear and non-linear echo signals from various depths can be compared to eliminate effects of patient variation.

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38. (Previously Presented) The apparatus of claim 37, wherein the variation in fluid volumes calculations may be in the form of at least one of a look up table and a calibration curve.

39. (Previously Presented) The apparatus of claim 24, wherein the at least one transducer assembly include a display adapted to indicate a volume above a predetermined threshold level, the threshold level being determined according to a specified medical application.

40. (Previously Presented) The apparatus of claim 39, wherein the display indicates a filling below a predetermined threshold level, the threshold level being determined according to a specified medical application.

41. (Previously Presented) The apparatus of claim 24, wherein the at least one transducer assembly is housed separately and connected to the rest of the apparatus with a flexible cable.

42. (Previously Presented) The apparatus of claim 24, wherein the at least one transducer assembly comprises a combination of a first acoustic active surface for optimal transmission and reception at the fundamental frequency and second acoustic active surface for optimal reception of the harmonic echo signals.

43. (Previously Presented) The apparatus of claim 24, wherein the at least one transducer assembly comprises a plurality of ultrasound transducers mounted thereon for transmitting and receiving a plurality of ultrasound signals into the bladder at least one of plural angles of incidence and plural spatial locations for providing a narrow beam direction in the dorsal direction to detect the anterior and posterior bladder wall.

44. (Previously Presented) A method comprising:

positioning at least one transducer assembly in view of a body cavity;

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transmitting a fundamental ultrasound frequency of at least one acoustic power to the body cavity;

receiving echoes having the fundamental ultrasound frequency and at least one harmonic frequency thereof associated with the body cavity;

converting the received ultrasound echoes into fundamental signals and harmonic signals;

determining at least one harmonic energy level value associated with the echoes;

calculating a fluid volume contained in the cavity based upon the at least one harmonic energy level value associated with an echo having passed through the fluid; and

adjusting the calculation by comparison with at least one of a look up table and a calibration curve.

45. (Previously Presented) A method for detecting a body cavity of a subject, measuring the volume of the body cavity and a fluid volume contained in the body cavity comprising:

positioning at least one transducer assembly in view of the body cavity;

transmitting a fundamental ultrasound frequency of at least one acoustic power to the body cavity;

receiving echoes having the fundamental ultrasound frequency and at least one harmonic frequency thereof associated with the body cavity;

converting the received ultrasound echoes into fundamental signals and harmonic signals;

determining boundary information of the cavity from the harmonic signals in terms of depth, height, and correction factor, K;

calculating at least one of the volume of the cavity from the boundary information and the fluid volume in the body cavity as a product of depth, height, and correction factor K; and

adjusting the calculation by comparison with at least one of a look up table and a calibration curve.

46. (Previously Presented) The method of claim 45, wherein the correction factor K is obtainable from the look up table and the calibration curve.

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47. (Cancelled)

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